

TRIBAL REVISIONS IN THE ASTERACEAE. I.

THE RELATIONSHIP OF GEISSOLEPIS.

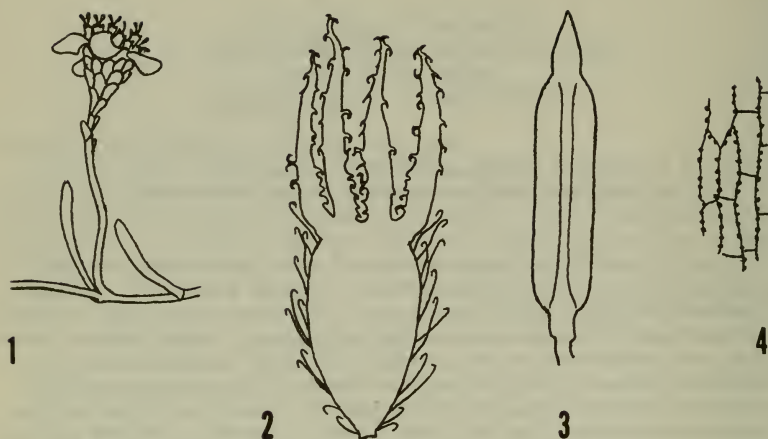
H. Robinson and B. D. Brettell
Smithsonian Institution, Washington, D.C. 20560.

In 1892 B. L. Robinson described a new genus and species, Geissolepis suaedaefolia, based on a Pringle collection from the state of San Luis Potosi in Mexico. The genus was placed in the Heliantheae-Galinsoginae near Blepharipappus. Significant features of the new genus included the heads heterogamous, radiate; flowers all fertile; involucre turbinate-campanulate, scales ovate, obtuse, closely imbricated in 4-5 rows, the outer regularly shorter (Fig. 1), receptacle paleaceous, paleae obovate, obtuse, ciliate; style divided nearly to the middle, the branches flattened, bearing short conical appendages; and achenes 4-angled, pubescent, crowned with 7-8 very acute awl-shaped minutely and retrorsely ciliated scales (Fig. 2). The well imbricated scales of the involucre were considered one of the distinctive characters of the genus. No more recent evaluation of the genus seems to have been attempted, and no additional species have been named.

The advent of the New Synantherology (King and Robinson, 1970) and the recognition of many significant microscopic characters has made possible the reevaluation of the relationships of many genera. Such investigation shows the need to transfer Geissolepis from the Heliantheae-Galinsoginae to the Astereae. The microscopic characters on which the conclusion is based are particularly clear though they are mostly unrecognized in previous literature. The characters of Geissolepis reviewed in this study are as follows.

The anther appendages are flat and narrowly triangular with narrow vertical rather thick-walled cells (Fig. 3). Such appendages being distinctly narrower than the thecae are characteristic of the Astereae and are also seen in the Senecioneae. The Heliantheae, in contrast, have broader and strongly keeled anther appendages with cells often in a radiating pattern.

The exothecial cells of the anther are longer than wide with the intercellular thickenings almost restricted to the vertical walls (Fig. 4). Such exothecial cells are characteristic of almost all genera of the Astereae, being definitely absent only in the subtribe Hinterhuberinae. Such cells also occur in most of the Senecioneae though exceptions are frequent.



Figures 1-4. *Geissolepis suaedaefolia* B.L.Robinson. 1. Single inflorescence. 2. Outline of achene with pappus. 3. Stamen. 4. Exothecial cells.

In the Heliantheae the exothecial cells are subquadrate to elongate with intercellular thickenings usually nearly restricted to the transverse walls. The rare exceptions in the Heliantheae such as one subgenus of the genus *Tridax* have the region of laterally thickened exothecial cells more restricted and have other totally non-asterean features of the anther appendage, style, and phyllaries.

The stylar appendage is broadly triangular with a smooth inner surface and a densely papillose outer surface. Such style appendages are the form most often represented in the fertile flowers of the Astereae. The description of the stylar appendages as conical by B.L.Robinson was unfortunate and inaccurate. The appendages of the Heliantheae are often truly conical or even linear with papillae usually more evenly distributed.

The style base is enlarged and seated directly on a truncated cylindrical nectary. Such style bases and nectaries are characteristic of Astereae and typical Senecioneae and are found in such groups as the Mutisieae. In the Heliantheae the style base and nectary are highly variable but the former is almost always sunken to some degree into the latter.

A confirming character of the plant proves to be the well imbricated involucre noted by B.L.Robinson. Such an involucre would be very distinctive among the Heliantheae but is very common among the Astereae.

The original assignment of Geissolepis to the Heliantheae might have been because of the combination of the receptacle with paleae and the non setose pappus. Both of these features are known to occur in other genera of the Astereae and in a few genera they are combined.

References

- King, R. M. and H. Robinson 1970. The new synantherology. *Taxon* 19 (1): 6-11.
- Robinson, B. L. 1892. Descriptions of new plants collected in Mexico by C. G. Pringle, in 1890 and 1891, with notes upon a few other species. *Proc. Amer. Acad.* 27: 165-185.